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EXAMINER	
SINCLAIR, DAVID M	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/589,350	HOSHINO, TOMOHISA	
	Examiner	Art Unit	
	DAVID M. SINCLAIR	2831	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 November 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-10,13,18 and 20-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-10,13,18,20-23 and 25-28* is/are rejected.

7)☐ Claim(s) *24* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 03 November 2009 have been fully considered but they are not persuasive.

Applicant argues that Kobayashi, Ryhanen, and Ackland fail to disclose the limitation “a capacity type sensor detector to detect an impedance change between said first electrode and said second electrode." However, all the above references disclose a capacity sensor comprising a detector that detects a change in capacitance, thus capable of detecting a change in impedance as the formula of impedance is $Z = \sqrt{R^2 + (\frac{1}{2}\pi fC)^2}$ where Z is impedance, R is resistance, f is frequency, and C is capacitance. Furthermore, to detect a change in an impedance between said first electrode and said second electrode is considered to be a functional recitation that and has not been given patentable weight because it is narrative form. In re Fuller, 1929 C.D. 172; 388 O.G. 279.

Applicant further argues that Ryhanen fails to disclose “a potential equalizer to make the potential difference between said first electrode and said guard electrode close to zero.” However, Ryhanen discloses said limitation specifically see paragraph [0068].

Applicant further argues the use of Zias as disclosing a “plate type thin film portion which is constituted by a depression at the central part of a lower side of

said first or second electrode" specifically arguing "Zias's portion 216 contacts dielectric material 221 and there is no space between those layers". However, the claim does not require a space between the dielectric layer and the plate type thin film portion. Zias discloses forming a depression which forms a plate type thin film portion which constitutes a vibrating electrode. Furthermore, Zias figures 15, 19, & 20 shows an embodiment wherein there is a space between the dielectric layer and the plate type thin film portion. It is the contention of the examiner that Zias discloses "plate type thin film portion which is constituted by a depression at the central part of a lower side of said first or second electrode" and can be seen in Zias's figures specifically 15, 19, 20, &22

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the

rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 9, & 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Kobayashi (2003/0080755).

In regards to claim 1, Kobayashi '755 discloses

A capacity type sensor comprising: a first electrode (61a/61b – fig. 13; [0099]); a second electrode (63 – fig. 13; [0099]) which is disposed opposedly to said first electrode; a guard electrode (611/621 – fig. 13; [0099]) which is disposed opposedly to said first electrode; a potential equalizer to make the potential difference between said first electrode and said guard electrode close to zero; and a capacity type sensor detector to detect impedance change between said first electrode and said second electrode, wherein said guard electrode is disposed between said first electrode and said second electrode (fig. 13; [0022] & [0100]).

In regards to claim 9, Kobayashi '755 discloses

The capacity type sensor according to claim 1, wherein both of said first electrode and said second electrode are fixed electrodes ([0087]).

In regards to claim 23, Kobayashi '755 discloses

The capacity type sensor of claim 1, wherein the potential equalizer is an analog buffer arranged between the guard electrode and the first electrode (fig. 13; [0022] & [0100]).

4. Claims 1, 10, & 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Ackland et al. (6,097,195).

In regards to claim 1, Ackland '195 discloses

A capacity type sensor comprising: a first electrode (44 – fig. 3b; C4:L63); a second electrode (48 – fig. 3b; C5:L20-21) which is disposed opposedly to said first electrode; a guard electrode (46 – fig. 3b; C3:L64) which is disposed opposedly to said first electrode; a potential equalizer to make the potential difference between said first electrode and said guard electrode close to zero (C4:L61 to C5:L24); and a capacity type sensor detector to detect impedance change between said first electrode and said second electrode (abstract), wherein said guard electrode is disposed between said first electrode and said second electrode (fig. 3b).

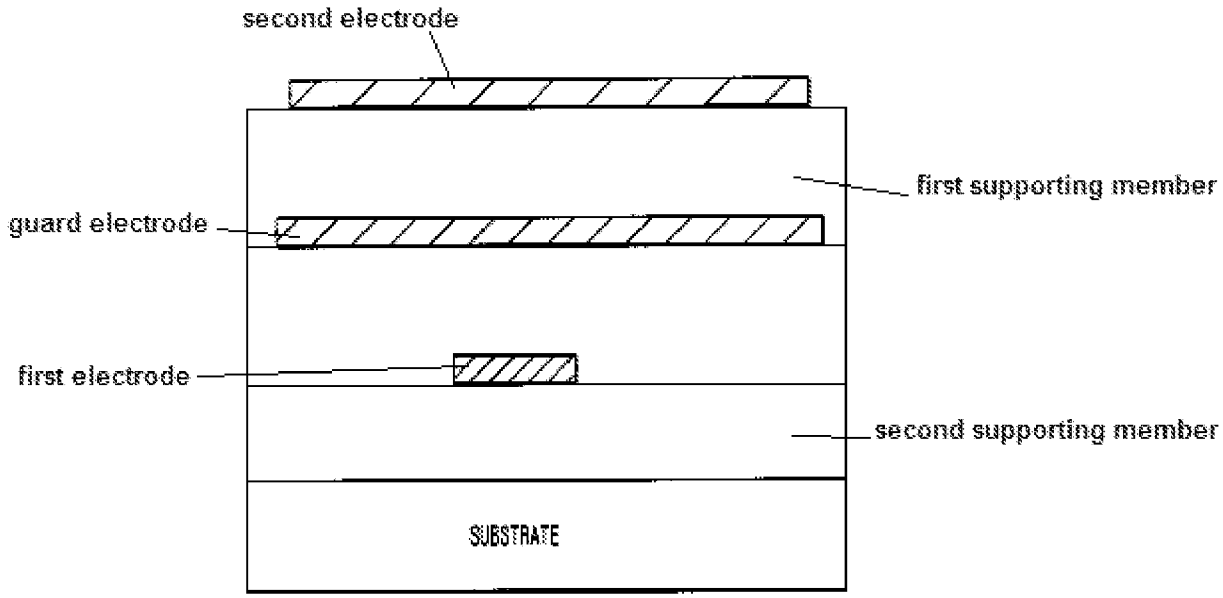

Figure 2: Altered version of Ackland '195 showing dielectric layers and examiner labels

In regards to claim 10, Ackland '195 discloses

A capacity type sensor comprising: a first electrode (44 – fig. 3b; C4:L63) and a second electrode (48 – fig. 3b; C5:L20-21) which are opposedly disposed each other and an area of either one of said first and second electrode is made narrower than another (fig. 3b); and a first supporting member (preset office action fig. 2 (POA2) & C3:L45-51) which is disposed outside of outer periphery of one of said electrodes with a narrower area to support another one of said electrodes with a wider area; a substrate, wherein said supporting member supports said electrode with the wider area on said substrate (POA2), and either one of said first or second electrodes is disposed on said substrate, and a

second supporting member is disposed between said substrate either one of said electrodes which is disposed on said substrate (POA2); a guard electrode (46 – fig. 3b; C3:L64) which is disposed between said first supporting member and said second supporting member; a potential equalizer to make the potential difference between said first electrode and said guard electrode close to zero (C4:L61 to C5:L24); and a capacity type sensor detector to detect impedance change between said first electrode and said second electrode (abstract & C2:L35-36).

In regards to claim 23, Ackland '195 discloses

The capacity type sensor of claim 1, wherein the potential equalizer is an analog buffer arranged between the guard electrode and the first electrode (C4:L61 to C5:L24).

5. Claims 1, 3-4, 9, 18, & 23 are rejected under 35 U.S.C. 102(e) as being anticipated by Ryhanen et al. (2005/0030724).

In regards to claim 1, Ryhanen '724 discloses

A capacity type sensor comprising: a first electrode (s - fig. 13; [0069]); a second electrode (D – fig. 13; [0069]) which is disposed opposedly to said first electrode; a guard electrode (g – fig. 13; [0069]) which is disposed opposedly to said first electrode; a potential equalizer to make the potential difference between said first electrode and said guard electrode close to zero ([0068]); and a capacity type sensor detector to detect impedance change between said first electrode and

said second electrode ([0064-0065]); wherein said guard electrode is disposed between said first electrode and said second electrode (fig. 13).

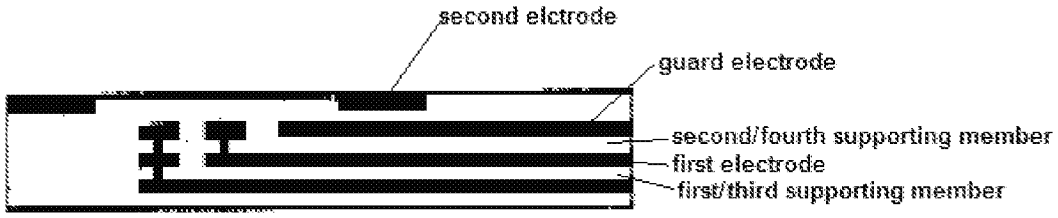

Figure 1: Altered version of Ryhanen '724 fig. 13a showing examiner labels

In regards to claim 3, Ryhanen '724 discloses

The capacity type sensor according to claim 1 further comprising a first supporting member to fix said guard electrode and said first electrode (present office action fig. 1 (POA1).

In regards to claim 4, Ryhanen '724 discloses

The capacity type sensor according to claim 1 further comprising a second supporting member to fix said second electrode and said guard electrode (POA1).

In regards to claim 9, Ryhanen '724 discloses

The capacity type sensor according to claim 1, wherein both of said first electrode and said second electrode are fixed electrodes (fig. 13).

In regards to claim 18, Ryhanen '724 discloses

A capacity type sensor comprising: a first electrode with wider area (s - fig. 13; [0069]); a second electrode with narrower area (D – fig. 13; [0069]) which is disposed on said first electrode with the wider area; a third supporting member which is formed on said first electrode with the wider area; and a fourth supporting member which is supported by said third supporting member, wherein said second electrode with the narrower area is formed on said fourth supporting member (present office action fig. 1 (POA1)); a guard electrode (g – fig. 13; [0069]) which is disposed between said third supporting member and said fourth supporting member (POA1); a potential equalizer to make the potential difference between said first electrode and said guard electrode close to zero ([0068] & [0074]); and a capacity type sensor detector to detect impedance change between said first electrode and said second electrode ([0064-0065]).

In regards to claim 23, Ryhanen '724 discloses

The capacity type sensor of claim 1, wherein the potential equalizer is an analog buffer arranged between the guard electrode and the first electrode ([0068]).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 1, 3-5, 8, 10, 13, 20-23, & 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ikeda et al. (6,145,384) in view of Ryhanen '724.

In regards to claim 1,

Ikeda '384 discloses a capacity type sensor comprising: a first electrode (111 – fig. 5; C8:L66 to C9:L23); a second electrode (161 – fig. 5; C8:L66 to C9:L23) which is disposed opposedly to said first electrode; a guard electrode (116 – fig.5; C8:L66 to C9:L23) which is disposed opposedly to said first electrode; a potential equalizer to make the potential difference between said first electrode and said guard electrode close to zero; and a capacity type sensor detector to detect impedance change between said first electrode and said second electrode (fig. 6; C10:L46 to C12:L40). Ikeda '384 fails to disclose wherein said guard electrode is disposed between said first electrode and said second electrode.

Ryhanen '724 discloses a substrate, a first guard electrode, a first supporting member, a sensor electrode, a second supporting member, a second guard electrode, a third supporting member, and a drive electrode (fig. 13a).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use two guard electrodes which sandwich a first electrode as taught by Ryhanen '724 in the capacity type sensor of Ikeda '384 to obtain a capacity type sensor in which the fixed electrode has excellent guarding properties.

In regards to claim 3,

The references as applied above disclose all the limitations of claim 3 except a first supporting member to fix said guard electrode and said first electrode. Ikeda '384 further discloses a first supporting member (120 – fig. 5; C8:L66 to C9:L23) to fix said guard electrode and said first electrode.

In regards to claim 4,

The references as applied above disclose all the limitations of claim 4 except a second supporting member to fix said second electrode and said guard electrode. Ikeda '384 further discloses a second supporting member to fix said

second electrode and said guard electrode (130 & 150 – fig. 5; C8:L66 to C9:L23).

In regards to claim 5,

The references as applied above disclose all the limitations of claim 5 except a substrate on which either one of said first electrode or said second electrode, and said guard electrode are formed, wherein said guard electrode is made out of semiconductor layer which has different conductivity type from said first electrode or said second electrode. Ikeda '384 further discloses a substrate (100 – fig. 5; C8:L66 to C9:L23) on which either one of said first electrode or said second electrode, and said guard electrode are formed (fig. 5), wherein said guard electrode is made out of semiconductor layer which has different conductivity type from said first electrode or said second electrode (C14:L6-11).

In regards to claim 8,

The references as applied above disclose all the limitations of claim 8 except at least one of said first electrode and said second electrode is a vibrating electrode. Ikeda '384 further discloses at least one of said first electrode and said second electrode is a vibrating electrode (161 – fig. 5; C8:L66 to C9:L23).

In regards to claim 10,

Ikeda '384 discloses a capacity type sensor comprising: a first electrode (111 – fig. 4-5; C8:L66 to C9:L23) and a second electrode (161 – fig. 4-5; C8:L66 to C9:L23) which are opposedly disposed each other and an area of either one of said first and second electrode is made narrower than another (fig. 4); and a first supporting member (130 – fig. 5) which is disposed outside of outer periphery of one of said electrodes with a narrower area to support another one of said electrodes with a wider area (fig. 5); a substrate (100 – fig. 5; C8:L66 to C9:L23), wherein said supporting member supports said electrode with the wider area on said substrate (fig. 5), and either one of said first or second electrodes is disposed on said substrate; and a second supporting member (120 – fig. 5) is disposed between said substrate and either one of said electrodes which is disposed on said substrate; a guard electrode; a potential equalizer to make the potential difference between said first electrode and said guard electrode close to zero; and a capacity type sensor detector to detect an impedance change between said first electrode and said second electrode. Ikeda '384 fails to disclose a guard electrode which is disposed between said first supporting member and said second supporting member.

Ryhanen '724 discloses a substrate, a first guard electrode, a first supporting member, a sensor electrode, a second supporting member, a second guard electrode, a third supporting member, and a drive electrode (fig. 13a).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use two guard electrodes which sandwich a first electrode as taught by Ryhanen '724 in the capacity type sensor of Ikeda '384 to obtain a capacity type sensor in which the fixed electrode has excellent guarding properties.

In regards to claim 13,

The references as applied above disclose all the limitations of claim 13 except an opening portion is formed at the central part of said substrate, and said electrode formed on said second supporting member is a vibrating electrode. Ikeda '384 further discloses an opening portion is formed at the central part of said substrate (fig. 5), and said electrode formed on said second supporting member is a vibrating electrode (161 – fig. 5; C8:L66 to C9:L23).

In regards to claim 20,

The references as applied above disclose the claimed invention except for the second electrode is formed out of a substantially square single crystal silicon substrate. It would have been obvious to one having ordinary skill in the art at the time the invention was made to form the second electrode out of a substantially square single crystal silicon substrate, since it has been held to be within the general skill of a worker in the art to select a known material on the

basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

In regards to claim 21,

The references as applied above disclose the claimed invention except the guard electrode is formed out of a polycrystalline silicon film. It would have been obvious to one having ordinary skill in the art at the time the invention was made to form the guard electrode out of a polycrystalline silicon film, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

In regards to claim 22,

The references as applied above disclose the claimed invention except for the first electrode is formed in a rhombic shape. It would have been an obvious matter of design choice to form the first electrode in a rhombic shape, since such a modification would have involved a mere change in the shape of a component. A change in shape is generally recognized as being within the level of ordinary skill in the art. *In re Dailey, 357 F.2d 669, 149 USPQ 47 (CCPA 1966)*

In regards to claim 23,

The references as applied above disclose all the limitations of claim 23 except the potential equalizer is an analog buffer arranged between the guard electrode and the first electrode. Ikeda '384 further discloses the potential equalizer is an analog buffer arranged between the guard electrode and the first electrode (fig. 6; C10:L46 to C12:L40).

In regards to claim 26,

The references as applied above disclose all the limitations of claim 26 except the second supporting member is ring shaped and is disposed between the guard electrode and the second electrode. Ikeda '384 further discloses the second supporting member is disposed between the guard electrode and the second electrode. Ikeda '384 disclose the claimed invention except for the second supporting member is ring shaped. It would have been an obvious matter of design choice to form the second supporting member to be ring shaped, since such a modification would have involved a mere change in the shape of a component. A change in shape is generally recognized as being within the level of ordinary skill in the art. *In re Dailey, 357 F.2d 669, 149 USPQ 47 (CCPA 1966)*

In regards to claim 27,

The references as applied above disclose all the limitations of claim 27 except the second supporting member is made out of silicon oxide film. Ikeda '384

further discloses the second supporting member is made out of silicon oxide film (C9:L62-63 & C10:L4-5).

9. Claims 1, 3-5, 8, 10, 13, 20-23, & 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ikeda '384 in view of Ackland '195.

In regards to claim 1,

Ikeda '384 discloses a capacity type sensor comprising: a first electrode (111 – fig. 5; C8:L66 to C9:L23); a second electrode (161 – fig. 5; C8:L66 to C9:L23) which is disposed opposedly to said first electrode; a guard electrode (116 – fig.5; C8:L66 to C9:L23) which is disposed opposedly to said first electrode; a potential equalizer to make the potential difference between said first electrode and said guard electrode close to zero; and a capacity type sensor detector to detect impedance change between said first electrode and said second electrode (fig. 6; C10:L46 to C12:L40). Ikeda '384 fails to disclose wherein said guard electrode is disposed between said first electrode and said second electrode.

Ackland '195 discloses a capacity type sensor comprising: a first electrode (44 – fig. 3b; C4:L63) and a second electrode (48 – fig. 3b; C5:L20-21) and a first supporting member (POA2 & C3:L45-51) which is disposed outside of outer periphery of one of said electrodes; a substrate, wherein said supporting member supports said electrode with the wider area on said substrate (POA2), and either one of said first or second electrodes is disposed on said substrate, and a

second supporting member is disposed between said substrate either one of said electrodes which is disposed on said substrate (POA2); a guard electrode (46 – fig. 3b; C3:L64) which is disposed between said first supporting member and said second supporting member; a potential equalizer to make the potential difference between said first electrode and said guard electrode close to zero (C4:L61 to C5:L24); and a capacity type sensor detector to detect impedance change between said first electrode and said second electrode (abstract & C2:L35-36).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the guard electrode of Ikeda '384 between the first and second electrodes as taught by Ackland '195 as such a combination is a mere rearrangement of parts which would only require routine skill in the art. *In re Japikse*, 86 USPQ 70 (CCPA 1950).

In regards to claim 3,

The references as applied above disclose all the limitations of claim 3 except a first supporting member to fix said guard electrode and said first electrode. Ikeda '384 further discloses a first supporting member (120 – fig. 5; C8:L66 to C9:L23) to fix said guard electrode and said first electrode.

In regards to claim 4,

The references as applied above disclose all the limitations of claim 4 except a second supporting member to fix said second electrode and said guard electrode. Ikeda '384 further discloses a second supporting member to fix said second electrode and said guard electrode (130 & 150 – fig. 5; C8:L66 to C9:L23).

In regards to claim 5,

The references as applied above disclose all the limitations of claim 5 except a substrate on which either one of said first electrode or said second electrode, and said guard electrode are formed, wherein said guard electrode is made out of semiconductor layer which has different conductivity type from said first electrode or said second electrode. Ikeda '384 further discloses a substrate (100 – fig. 5; C8:L66 to C9:L23) on which either one of said first electrode or said second electrode, and said guard electrode are formed (fig. 5), wherein said guard electrode is made out of semiconductor layer which has different conductivity type from said first electrode or said second electrode (C14:L6-11).

In regards to claim 8,

The references as applied above disclose all the limitations of claim 8 except at least one of said first electrode and said second electrode is a vibrating electrode. Ikeda '384 further discloses at least one of said first electrode and said second electrode is a vibrating electrode (161 – fig. 5; C8:L66 to C9:L23).

In regards to claim 10,

Ikeda '384 discloses a capacity type sensor comprising: a first electrode (111 – fig. 4-5; C8:L66 to C9:L23) and a second electrode (161 – fig. 4-5; C8:L66 to C9:L23) which are opposedly disposed each other and an area of either one of said first and second electrode is made narrower than another (fig. 4); and a first supporting member (130 – fig. 5) which is disposed outside of outer periphery of one of said electrodes with a narrower area to support another one of said electrodes with a wider area (fig. 5); a substrate (100 – fig. 5; C8:L66 to C9:L23), wherein said supporting member supports said electrode with the wider area on said substrate (fig. 5), and either one of said first or second electrodes is disposed on said substrate; and a second supporting member (120 – fig. 5) is disposed between said substrate and either one of said electrodes which is disposed on said substrate; a guard electrode; a potential equalizer to make the potential difference between said first electrode and said guard electrode close to zero; and a capacity type sensor detector to detect an impedance change between said first electrode and said second electrode. Ikeda '384 fails to disclose a guard electrode which is disposed between said first supporting member and said second supporting member.

Ackland '195 discloses a capacity type sensor comprising: a first electrode (44 – fig. 3b; C4:L63) and a second electrode (48 – fig. 3b; C5:L20-21) and a first

supporting member (POA2 & C3:L45-51) which is disposed outside of outer periphery of one of said electrodes; a substrate, wherein said supporting member supports said electrode with the wider area on said substrate (POA2), and either one of said first or second electrodes is disposed on said substrate, and a second supporting member is disposed between said substrate either one of said electrodes which is disposed on said substrate (POA2); a guard electrode (46 – fig. 3b; C3:L64) which is disposed between said first supporting member and said second supporting member; a potential equalizer to make the potential difference between said first electrode and said guard electrode close to zero (C4:L61 to C5:L24); and a capacity type sensor detector to detect impedance change between said first electrode and said second electrode (abstract & C2:L35-36).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the guard electrode of Ikeda '384 between the first and second supporting members as taught by Ackland '195 as such a combination is a mere rearrangement of parts which would only require routine skill in the art. *In re Japikse*, 86 USPQ 70 (CCPA 1950).

In regards to claim 13,

The references as applied above disclose all the limitations of claim 13 except an opening portion is formed at the central part of said substrate, and said electrode formed on said second supporting member is a vibrating electrode. Ikeda '384

further discloses an opening portion is formed at the central part of said substrate (fig. 5), and said electrode formed on said second supporting member is a vibrating electrode (161 – fig. 5; C8:L66 to C9:L23).

In regards to claim 20,

The references as applied above disclose the claimed invention except for the second electrode is formed out of a substantially square single crystal silicon substrate. It would have been obvious to one having ordinary skill in the art at the time the invention was made to form the second electrode out of a substantially square single crystal silicon substrate, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

In regards to claim 21,

The references as applied above disclose the claimed invention except the guard electrode is formed out of a polycrystalline silicon film. It would have been obvious to one having ordinary skill in the art at the time the invention was made to form the guard electrode out of a polycrystalline silicon film, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

In regards to claim 22,

The references as applied above disclose the claimed invention except for the first electrode is formed in a rhombic shape. It would have been an obvious matter of design choice to form the first electrode in a rhombic shape, since such a modification would have involved a mere change in the shape of a component. A change in shape is generally recognized as being within the level of ordinary skill in the art. *In re Dailey, 357 F.2d 669, 149 USPQ 47 (CCPA 1966)*

In regards to claim 23,

The references as applied above disclose all the limitations of claim 23 except the potential equalizer is an analog buffer arranged between the guard electrode and the first electrode. Ikeda '384 further discloses the potential equalizer is an analog buffer arranged between the guard electrode and the first electrode (fig. 6; C10:L46 to C12:L40).

In regards to claim 25,

The references as applied above disclose all the limitations of claim 25 except the first supporting member is disposed between the guard electrode and the first electrode. The combination of Ikeda '384 and Ackland '195 discloses the first supporting member is disposed between the guard electrode and the first electrode.

In regards to claim 26,

The references as applied above disclose all the limitations of claim 26 except the second supporting member is ring shaped and is disposed between the guard electrode and the second electrode. Ikeda '384 further discloses the second supporting member is disposed between the guard electrode and the second electrode. Ikeda '384 disclose the claimed invention except for the second supporting member is ring shaped. It would have been an obvious matter of design choice to form the second supporting member to be ring shaped, since such a modification would have involved a mere change in the shape of a component. A change in shape is generally recognized as being within the level of ordinary skill in the art. *In re Dailey, 357 F.2d 669, 149 USPQ 47 (CCPA 1966)*

In regards to claim 27,

The references as applied above disclose all the limitations of claim 27 except the second supporting member is made out of silicon oxide film. Ikeda '384 further discloses the second supporting member is made out of silicon oxide film (C9:L62-63 & C10:L4-5).

10. Claims 1, 6-7, 20-22, & 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zias et al. (2003/0072127) in view of Ackland '195.

In regards to claim 1,

Zias '127 discloses a capacity type sensor comprising: a first electrode (289 – fig. 22; [0043]); a second electrode (299/211/216 - fig. 22; [0043] & [0076]) which is disposed opposedly to said first electrode; and a capacity type sensor detector to detect impedance change between said first electrode and said second electrode ([0043]). Zias '127 fails to disclose a guard electrode which is disposed opposedly to said first electrode; a potential equalizer to make the potential difference between said first electrode and said guard electrode close to zero.

Ackland '195 discloses a capacity type sensor comprising: a first electrode (44 – fig. 3b; C4:L63) and a second electrode (48 – fig. 3b; C5:L20-21) and a first supporting member (POA2 & C3:L45-51) which is disposed outside of outer periphery of one of said electrodes; a substrate, wherein said supporting member supports said electrode with the wider area on said substrate (POA2), and either one of said first or second electrodes is disposed on said substrate, and a second supporting member is disposed between said substrate either one of said electrodes which is disposed on said substrate (POA2); a guard electrode (46 – fig. 3b; C3:L64) which is disposed between said first supporting member and said second supporting member; a potential equalizer to make the potential difference between said first electrode and said guard electrode close to zero (C4:L61 to C5:L24); and a capacity type sensor detector to detect impedance change between said first electrode and said second electrode (abstract & C2:L35-36).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the guard electrode and potential equalizer taught by Ackland '195 with the sensor of Zias '127 to obtain a sensor with a reduced parasitic capacitance which is more sensitive and therefore capable of detecting minute changes.

In regards to claim 6,

The references as applied above disclose all the limitations of claim 6 except said first electrode or said second electrode includes a plate type thin film portion which is constituted by a depression at the central part of lower side of said first or second electrode, and said thin film portion is a vibrating electrode. However, Zias further discloses said first electrode or said second electrode includes a plate type thin film portion (216 – fig. 22; [0076]) which is constituted by a depression at the central part of lower side of said first or second electrode (fig. 22), and said thin film portion is a vibrating electrode ([0044]).

In regards to claim 7,

The references as applied above disclose all the limitations of claim 7 except said first electrode or said second electrode including said thin film portion is a vibrating electrode. However, Zias further discloses said first electrode or said second electrode including said thin film portion is a vibrating electrode ([0044]).

In regards to claim 20,

The references as applied above disclose the claimed invention except for the second electrode is formed out of a substantially square single crystal silicon substrate. It would have been obvious to one having ordinary skill in the art at the time the invention was made to form the second electrode out of a substantially square single crystal silicon substrate, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

In regards to claim 21,

The references as applied above disclose the claimed invention except the guard electrode is formed out of a polycrystalline silicon film. It would have been obvious to one having ordinary skill in the art at the time the invention was made to form the guard electrode out of a polycrystalline silicon film, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

In regards to claim 22,

The references as applied above disclose the claimed invention except for the first electrode is formed in a rhombic shape. It would have been an obvious matter of design choice to form the first electrode in a rhombic shape, since such a modification would have involved a mere change in the shape of a component. A change in shape is generally recognized as being within the level of ordinary skill in the art. *In re Dailey, 357 F.2d 669, 149 USPQ 47 (CCPA 1966)*

In regards to claim 28,

The references as applied above disclose all the limitations of claim 28 except the depression has a trapezoidal shape. However, Zias further discloses the depression has a trapezoidal shape (fig. 22 & fig. 5).

11. Claims 1, 6-7, 20-22, & 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zias '127 in view of Ryhanen '724.

In regards to claim 1,

Zias '127 discloses a capacity type sensor comprising: a first electrode (289 – fig. 22; [0043]); a second electrode (299/211/216 - fig. 22; [0043] & [0076]) which is disposed opposedly to said first electrode; and a capacity type sensor detector to detect impedance change between said first electrode and said second electrode ([0043]). Zias '127 fails to disclose a guard electrode which is disposed opposedly to said first electrode; a potential equalizer to make the potential difference between said first electrode and said guard electrode close to zero.

Ryhanen '724 discloses a substrate, a first guard electrode, a first supporting member, a sensor electrode, a second supporting member, a second guard electrode, a third supporting member, and a drive electrode (fig. 13a).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the guard electrode and potential equalizer taught by Ryhanen '724 with the sensor of Zias '127 to obtain a sensor with a reduced parasitic capacitance which is more sensitive and therefore capable of detecting minute changes.

In regards to claim 6,

The references as applied above disclose all the limitations of claim 6 except said first electrode or said second electrode includes a plate type thin film portion which is constituted by a depression at the central part of lower side of said first or second electrode, and said thin film portion is a vibrating electrode. However, Zias further discloses said first electrode or said second electrode includes a plate type thin film portion (216 – fig. 22; [0076]) which is constituted by a depression at the central part of lower side of said first or second electrode (fig. 22), and said thin film portion is a vibrating electrode ([0044]).

In regards to claim 7,

The references as applied above disclose all the limitations of claim 7 except said first electrode or said second electrode including said thin film portion is a vibrating electrode. However, Zias further discloses said first electrode or said second electrode including said thin film portion is a vibrating electrode ([0044]).

In regards to claim 20,

The references as applied above disclose the claimed invention except for the second electrode is formed out of a substantially square single crystal silicon substrate. It would have been obvious to one having ordinary skill in the art at the time the invention was made to form the second electrode out of a substantially square single crystal silicon substrate, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

In regards to claim 21,

The references as applied above disclose the claimed invention except the guard electrode is formed out of a polycrystalline silicon film. It would have been obvious to one having ordinary skill in the art at the time the invention was made to form the guard electrode out of a polycrystalline silicon film, since it has been held to be within the general skill of a worker in the art to select a known material

on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

In regards to claim 22,

The references as applied above disclose the claimed invention except for the first electrode is formed in a rhombic shape. It would have been an obvious matter of design choice to form the first electrode in a rhombic shape, since such a modification would have involved a mere change in the shape of a component. A change in shape is generally recognized as being within the level of ordinary skill in the art. *In re Dailey, 357 F.2d 669, 149 USPQ 47 (CCPA 1966)*

In regards to claim 28,

The references as applied above disclose all the limitations of claim 28 except the depression has a trapezoidal shape. However, Zias further discloses the depression has a trapezoidal shape (fig. 22 & fig. 5).

12. Claims 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi ‘755/ Ackland ‘195/ Ryhanen ‘724.

In regards to claim 20,

The reference as applied above discloses the claimed invention except for the second electrode is formed out of a substantially square single crystal silicon substrate. It would have been obvious to one having ordinary skill in the art at

the time the invention was made to form the second electrode out of a substantially square single crystal silicon substrate, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

In regards to claim 21,

The reference as applied above discloses the claimed invention except the guard electrode is formed out of a polycrystalline silicon film. It would have been obvious to one having ordinary skill in the art at the time the invention was made to form the guard electrode out of a polycrystalline silicon film, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

In regards to claim 22,

The reference as applied above discloses the claimed invention except for the first electrode is formed in a rhombic shape. It would have been an obvious matter of design choice to form the first electrode in a rhombic shape, since such a modification would have involved a mere change in the shape of a component. A change in shape is generally recognized as being within the level of ordinary skill in the art. *In re Dailey, 357 F.2d 669, 149 USPQ 47 (CCPA 1966)*

Allowable Subject Matter

13. Claim 24 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

14. The following is a statement of reasons for the indication of allowable subject matter:

> The prior art does not teach or suggest (in combination with the other claim limitations) a capacity sensor wherein the potential equalizer is a gain circuit arranged between the guard electrode and the first electrode, the capacity type sensor detector is arranged between the gain circuit and the first electrode, and an output terminal is provided between the gain circuit and the capacity type sensor detector.

Conclusion

15. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Communication

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID M. SINCLAIR whose telephone number is (571)270-5068. The examiner can normally be reached on Mon - Thurs. 8-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego F. Gutierrez can be reached on (571) 272-2245. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Diego Gutierrez/

Supervisory Patent Examiner, Art Unit 2831

/D. M. S./
Examiner, Art Unit 2831